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1. The first part of the document is a list of references. The references are listed in two columns. The first column contains references to books and articles, and the second column contains references to books and articles. The references are listed in alphabetical order.

STRAP RETENTION SYSTEM AND USES THEREFOR

FIELD OF THE INVENTION

The present invention relates to fastening devices. In particular aspect, the present invention relates to a strap retention system ideally suited for watchbands and the like.

BACKGROUND OF THE INVENTION

The wristwatch is a commonly worn article. Other wrist-born devices such as tide timers (e.g., the Nixon SUPER HERO™), altimeters, pressure gauges, pedometers, and the like are becoming increasingly popular as well. Many of these devices make use of a strap having two free ends (as opposed to, for example, a metal bracelet with a flip catch) that are secured to one another, usually by means of an adjustable mechanism such as a buckle or similar securing mechanism.

One dilemma posed by the two piece strap with adjustable securing mechanism is what to do with the free end of the strap, once the strap has been adjusted to the desired size. If simply left to hang, the free end of the strap can work loose of the buckle thereby releasing the strap. Minimally, the free end is prone to get in the way if it is not secured in some manner. This problem is frequently dealt with by including retention loops near the buckle, for receiving the free end of the strap and maintaining it in close proximity to the other end of the strap (e.g., the end that has the buckle). Unfortunately, the retention loops can slide free of the strap end which is again left to hang loose. Securing the retention loops to the portion of the strap that is not hanging free prevents them from moving, but also limits the adjustability of the strap because the loops may not function properly over the full range of the strap's adjustability.

Any type of strap that is to be secured, for whatever purpose, may also suffer from the same problems described above. Examples, such as straps to secure luggage on a car roof, or the like, provide familiar instances where such problems may be encountered.

Accordingly, there is still a need in the art for a means to further securely retain the free end of a two-ended strap that is used in conjunction with a securing mechanism.

BRIEF DESCRIPTION OF THE INVENTION

5 The present invention overcomes many of the problems in the art by providing a retention system for straps. Invention retention systems provide structures that are easily incorporated into straps and which prevent inadvertent loosening of the strap, as well as maintaining the otherwise free end of a fastened strap in close proximity with the remainder of the strap. This latter property of the invention system provides a safety feature by preventing loose strap ends from interfering with strap use.

BRIEF DESCRIPTION OF THE FIGURES

10 Figures 1-8 depict different geometric shapes useful as retention loop components of mating structures.

DETAILED DESCRIPTION OF THE INVENTION

15 In accordance with the present invention, there is provided a fastening and retention system for a strap, said system comprising a strap having at a first strap end, a securing mechanism configured to receive a second strap end, and one or more retention loops for maintaining, when said second strap end has been secured by said securing mechanism, said second strap end in close contact with a portion of the strap that is proximal to the first strap end, wherein said retention loop(s) can slide along
20 said strap when the strap is not secured by said securing mechanism, wherein one or more of said retention loops comprises a first component of a mating structure, and said strap comprises a complementary component of the mating structure, and wherein said mating structure prevents said loop(s) from sliding freely along said strap when the two components are mated.

25 Any type of strap is suitable for use in the practice of the present invention, so long as it has a securing mechanism for mating opposing strap ends. As used herein, "securing mechanism" means any type of structure that is useful for securing one end

of a strap to another. Typically, such securing devices provide for adjustment of the strap length in order to modulate the tightness of the strap around the item to which it is secured. Thus, for example, a typical watchband has a buckle which allows for the strap to be cinched to a desired tightness. As a result of securing the strap, there will typically be excess strap at one end that would benefit from being retained to prevent inadvertent loosening, and/or to prevent the loose end of the strap from getting in the way. Any securing device that, when employed, results in a loose strap end can be employed in the practice of the present invention. Such structures include conventional prong-type buckles, FASTEX™-type buckles, cams, and the like.

The strap may be comprised of any suitable material for the intended application, including, for example, fabric, leather, metal (optionally with links, as required for flexibility), polymer (e.g., polyurethane, polyurethane/silicon blend, nylon, polyvinyl chloride (PVC), or the like), leather, and the like.

In one embodiment, the strap is configured to receive thereon a device. For example, a plain strap can have attachment points, such as loops, or the like, for fastening a device to the strap. In another embodiment, the strap is a two piece strap, such as a watchband, that, upon attachment of the two pieces to a device, such as a watch, essentially becomes a single strap having two ends. Devices that are typically mounted on a strap include a wristwatch, an altimeter, a depth meter, a pedometer, a pager, a telephone, a personal data device, a tide meter, and the like. Literally any device that can be attached to a strap is contemplated for use in the practice of the present invention.

As used herein, "retention loop" means a structure that surrounds or is attached to the strap and which operates to hold one end of the strap in close proximity to the other end of the strap, when the strap has been secured by the securing mechanism. Again, referring to a watch band as an example, retention loops can be adjusted, typically by sliding them along the strap, in order to accommodate a range of lengths of excess strap material. Unfortunately, the adjustable nature of retention loops prevents them from securely retaining the excess strap material. For example, if the loop slides off of the end of the excess strap material, the excess hangs

free. A similar state results if the loop slides in the direction of the securing mechanism (e.g., buckle) to such an extent that the excess strap material extends past the retention loop far enough to again hang free. Thus, the present invention provides for both the strap and the retention loop to have a component of a mating structure for
5 securing the retention loop to the excess strap material, thereby preventing the loop from sliding off of the strap.

As used herein, "mating structures" means any structure that will provide for the temporary attachment of excess strap material to the retention loop. Accordingly, the structure will have a first component and a complementary component that mates
10 with the first component. The relative location of the first and complementary components is not important. Thus, either of the components can be located on the strap, with the other component being located on the loop.

In one embodiment of the present invention, the mating structure comprises a protruding member and a slot or recessed area for receiving same. The mating of the member-slot structure can merely comprise fitting the member into the slot, or it can
15 comprise a more positive lock. Positive locking between the member and the slot can be accomplished by providing for a snug fit of the member into the slot or the inclusion of a catch, such as additional mating structure inside or in the proximity of the slot, and corresponding additional mating structure on or in the proximity of the
20 member, or the like, wherein the catch is engaged by the application of pressure, or the like. Other types of mating structures can clearly be employed in the practice of the present invention, and are contemplated as within the scope of the present invention. Examples of such mating structures include hook and loop fasteners, and the like. Additional examples of structures which can be employed as the retention
25 loop component of the mating structures include those depicted in Figures 1-8, and the like.

While the invention has been described in detail with reference to certain preferred embodiments thereof, it will be understood that modifications and variations are within the spirit and scope of that which is described and claimed.